State of Trace Elements of Coal During Gasification, A. Attari and J. C. Pau, Institute of Gas Technology, 3424 South State Street, Chicago, Illinois 60616

A preliminary study has been initiated (under EPA sponsorship) to determine the concentration of some 35 trace elements in coal with particular emphasis on their fate and distribution among the various solid, liquid, and gaseous effluents of HYGAS pilot plant, now under operation at the Institute of Gas Technology. Coal and solid residue samples were obtained from the pretreatment, hydrogasification, and electrothermal stages of bench-scale development unit of the HYGAS plant. The samples were dry ashed in an oxygen plasma low-temperature asher and the resulting ash samples were decomposed with HF, then dissolved in perchloric acid for subsequent analysis by various atomic absorption methods, except for mercury, which was determined by a combustion-nonflame-AA method. Thus far, Sb, As, Be, Cd, Cr, Pb, Hg, Ni, Se, Te, and V levels have been measured in feed and solid residues of a bituminous coal and the results show substantial removal of elements such as As, Cd, Pb, Hg, Se, and Te during gasification. These results, however, are based on a limited number of samples and further work is in progress to analyze a larger number of samples before any firm conclusions can be drawn.